I. Project Title: Identification and Curation of Larval Fish by Colorado State University Larval Fish Laboratory.

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III. Project Summary: This ongoing project provides for (1) the identification and processing of preserved fish from the Interagency Standardized Monitoring Program (ISMP) and (2) the long-term care, backlog cataloging, and accessibility of preserved fish from Upper Colorado River Basin (UCRB) collections. The Larval Fish Laboratory currently maintains over 73,000 lots of UCRB fish collected from 1976 through 1998 (an estimated 3.75 million specimens). Sixty-two Fall 1998 ISMP collections were processed. In addition to normal curatorial activities, 3,857 lots of backlogged, pre-1994 collections were catalogued, relabeled, and reorganized for easy access; work on remaining backlog collections should be completed in FY 2001.

IV. Study Schedule: Preserved collections processed under this project are identified, counted, measured, cataloged, and reported upon as soon as possible after they are received. Storage upgrading and cataloging of backlog pre-1994 collections was begun in FY 97 and continues on a year-round basis. Work on backlog collections was originally scheduled to be completed in FY 99, but will be extended to FY 2001 to accommodate project budget reductions in FY 97, FY 99, and FY 2000. General collection maintenance (e.g., fluid level and container checks) is conducted annually and collection management is ongoing as needed.

V. Relationship to RIPRAP: This project is related to General Recovery Program Support Action Plan V (monitor populations and habitat and conduct research to support recovery actions, research, monitoring, and data management). Identification and processing of ISMP collections helps facilitate Task V.A.1 (measure and document population and habitat parameters to determine status and biological response to recovery actions –conduct standardized monitoring program). The remainder of the project specifically addresses Task V.E (provide for long-term care, cataloging, and accessibility of preserved specimens) and, in that preserved specimens are the ultimate natural history database, Task V.A.2 (. . .–conduct interagency data management program to compile, manage, and maintain all research and monitoring data collected by the Recovery Program).

VI. Accomplishments of FY 99 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings: The FY 99 goals and objectives of this ongoing project have been met except for the anticipated upgrade of LFL's collection management and cataloging program (from DOS-based MUSE to Windows-based SPECIFY), update of printed and *dBase* versions of the collection catalog for the Interagency Database Management Program (IDMP), and the cataloging of fewer backlog collections than anticipated by September 30. All have been delayed for logistical reasons, mostly because the long-anticipated program upgrade and converted catalog database files were not received until October 1999. The new program should be fully installed and implemented this winter and the remaining FY 99 tasks which dependent on implementation of the new program have been deferred to FY 2000. Delays in cataloging backlog collections were in part due to temporary shifts of personnel to other RIP projects.

Fall 1998 ISMP collections were identified, counted, measured, cataloged, stored, and reported upon on schedule (see Appendix A for summary of results). Printed data reports and copies of computer database files (*dBase*) for those collections were submitted to the source agencies, Colorado Division of Wildlife (CDOW, Grand Junction) and Utah Division of Wildlife Resources (UDWR, Moab), and U. S. Fish and Wildlife Service (USFWS, Grand Junction); copies of the database files were submitted to IDMP.

Curation of larval and other small-fish collections in FY 99 included: (1) annual fluid-level and container checks for over 73,000 lots of preserved UCRB specimens, (2) maintenance of the collection catalog, (3) management of access to specimens and associated data, and (4) the third of a now five-year effort (FY 97-FY 2001) to complete cataloging and upgraded care and management of backlogged collections dating back to 1976 (about 33,000 lots at the beginning of this effort in FY 97). The latter effort includes switching specimens to new containers and preservative if necessary, relabeling each lot with standard-format cataloged-collection labels, and systematically reorganizing the lots on collection shelving for easy access. As of September 30, 1999, a total of 56,138 lots of fish have been cataloged as part of the LFL Collection. Of these, 3,857 backlog and 3,092 recently processed lots (6,949 total lots) were added to the cataloged collection during FY 99. Recently processed collections are cataloged as part of the cost of collection processing rather than under this project. Appendix B lists the study-year sets of recently processed and backlog collections that were cataloged during FY 99. An additional 1,414 lots from backlog collections were cataloged during October and November 1999 with FY 99 funds.

Efforts to assure the future permanency of the collection continued in FY 99. Prospects remain promising for a move of the LFL Collection, along with other Colorado State University natural history research collections, to campus facilities renovated specifically for these collections. The move should occur in four or five years.

VII. Recommendations: As of September 30 1999, 16% (about 11,500 lots) of our UCRB holdings remained as uncataloged, minimally maintained, backlog (pre-1994) collections (14%, about 10,100 lots as of November 31). We hoped to complete the task of cataloging and upgrading care and management of all remaining backlogged UCRB small-fish collections in FY 2000 but the budget for such was again reduced, necessitating extension of this aspect of Project 15 through FY 2001. Accordingly, we recommend that FY 2001 Program Guidance for Project 15 specify sufficient funds for completion of this task as well as processing new preserved collections covered by this project (e.g., fall 1999 ISMP) and continued long-term maintenance and management (curation) of all UCRB specimens held by LFL.

VIII. Project Status: On-track and ongoing.

IX. FY 99 Budget

A. Funds provided: $50,000
B. Funds expended: $39,174
C. Difference: $10,826
These funds are still needed to complete FY 99 tasks delayed to FY 2000 (see Section VI).
D. Percent of the FY 99 work completed, and projected costs to complete:
78% and $10,826, as of September 30.
E. Recovery Program funds spent for publication charges: $0

X. Status of Data Submission: Preserved fish data for Fall 1998 ISMP collections were submitted as a printed data report and *dBase* files to Colorado Division of Wildlife, Utah Division of Wildlife Resources, and USFWS, and as *dBase* files to IDMP. Preparation of updated *dBase* and printed versions (selected fields) of the LFL collection catalog and delivery of same to IDMP have been deferred to FY 2000.

XI. Signed: Darrel E. Snyder December 3, 1999
Principal Investigator Date

Signed: Diane L. Miller December 3, 1999 Principal
Investigator Date

Signed: Kevin R. Bestgen December 3, 1999
Principal Investigator Date

APPENDIX A:

Brief summary of results for preserved fall 1998 ISMP seine collections, Colorado River and lower Green River, September 22-25, 1998 (abstracted from LFL data report submitted to responsible agencies, 3 February 1999).

This report covers the preserved fishes in 62 collections taken during the 1998 fall monitoring program (ISMP)—24 from the Colorado River in Colorado (river miles 164.0-138.8, collection numbers CO01-CO24), 21 from the Colorado River in Utah (river miles 108.8-3.3 above the confluence with the Green River, collection numbers YC01-YC68), and 17 from the lower Green River in Utah (river miles 114.8-4.2, collection numbers YG01-YG92). It is a printed version of the *dBase* files "98YOY.DBF" (collection data and length frequencies) and "98YOY-ES.DBF" (individual total lengths for endangered species such as Colorado pikeminnow and total lengths and dorsal and anal fin-ray counts for chubs, *Gila* spp.). These files (and an associated file of collection data transcribed from field sheets, 98YOY-C.DBF) have been electronically transmitted to the recovery program database repository, USFWS, Grand Junction, as well as both source agencies. Included on the following pages are individual collection data (pages 3-11), an overall summary by species for each reach (pages 12-14) and all reaches combined (page 15), a list of Colorado pikeminnow captures with individual total lengths (page 16), a list of chub captures with individual total lengths and dorsal and anal fin-ray counts (page 17), comments for database records including total lengths for specimens greater than 90 mm TL (page 18), and a list of table and species abbreviations used in this or other Upper Colorado River Basin reports and databases (pages 19-20). The specimens have been cataloged (LFL 50681-50971) and are stored as part of the Larval Fish Laboratory Collection for voucher and future study (e.g., identification of humpback chub, food habits, condition, parasites).

In all, the collections received contain 20,091preserved fish (an average of 324 specimens per collection) representing six families and 16 species. Of those fish, 1,912 are from the upper Colorado River reach (UCRR), 15,408 from the lower Colorado River reach (LCRR), and 2,771 from the lower Green River reach (LGRR). Less than 1% of the fish are native species (3 cyprinids and 2 catostomids), <1% for the UCRR and LCRR, and 2% for the LGRR. Overall, cyprinids (seven species) account for 98%, catostomids (three species) <1%, and other families (seven species) 2% of all fish received. For the UCRR the respective percentages are 82%, 3%, and 15%, for the LCRR 99%, 0%, and <1%, and for the LGRR 99%, <1%, and 1%. Percentage compositions for species representing 1% or more of the preserved collections are: from the UCRR–red shiner 46%, fathead minnow 28%, green sunfish 10%, sand shiner 6%, white sucker 3%, mosquitofish 3%, and largemouth bass 2%; from the LCRR–sand shiner 57%, red shiner 41%, and fathead minnow 2%; and from the LGRR–red shiner 82%, sand shiner 11%, fathead minnow 5%, speckled dace 1%, and mosquitofish 1%.

A total of 18 Colorado pikeminnow (17-36mm TL) were preserved, ten (21-29mm TL) from the LCRR at river miles 97.0 to 30.0 and eight (17-36mm TL) from the LGRR at river miles 71.1 to 4.2; none were taken from the UCRR.

Chub (*Gila* species) are represented by a single roundtail chub (55mm TL, 9 dorsal and 9 anal fin rays) taken in the UCRR at river mile 146.8. No chub were preserved in the LCRR or LGRR collections.

APPENDIX B.

Study-year sets of Upper Colorado River Basin collection-species lots cataloged as part of the Colorado State University Larval Fish Laboratory Collection between October 1, 1998 and September 30, 1999 (total of 6,949 UCRB lots cataloged including 3,857 lots from backlogged, pre-1994 collections).

Beginning Cat. No.	Field Numbers	Description of Sample Sets
49173	FWS/V-87SN-017 to 1091	87 Nursery Habitat, SN, Green R., UT, Aug*
50302	UDWR-98DR-LT002 to 093	98 Larvae, Light Trap, Duchesne River, UT
50372	UDWR-98DR-SN002 to 005	98 Larvae, Seine, Duchesne River, UT
50379	UDWR-98LR-LT016 to 090	98 Levee Removal Light Trap, Green R., UT
50654	UDWR-98LR-DN002 to 026	98 Levee Removal Drift Net, Green R., UT
50681	FWS/GJ-98Y-CO01 to YG92	98 YOY, Fall ISMP, Seine, Colorado R.,CO
50972	(non-UCRB collections)	
50988	(non-UCRB collections)	
51043	FWS/V-87SN-012 to 1315	87 Nursery Hab, SN, Green R., UT, Jul-Oct*
51684	FWS-MG98L010 to 159	98 RZ, Light Trap, Middle Green R., UT
52014	UDWR-ABL98002 to 112	98 RZ , Light Trap, Lower Green R., UT
52064	UDWR-ABS98003 & 009	98 RZ , Seine, Lower Green R., UT
52066	UDWR-GRL98021 to 117	98 RZ , Light Trap, Lower Green R., UT
52162	UDWR-GRS98018 to 029B	98 RZ , Seine, Lower Green R., UT
52192	UDWR-MCL98008 to 104	98 RZ , Light Trap, Lower Green R., UT
52282	UDWR-MCS98004 & 007	98 RZ , Seine, Lower Green R., UT
52284	UDWR-SRL98001 to 155	98 RZ , Light Trap, Lower Green R., UT
52489	UDWR-SRS98012 to 023B	98 RZ , Seine, Lower Green R., UT
52505	UDWR-SRL98111	98 RZ , Light Trap, Lower Green R., UT*
52506	FWS-MG98L159	98 RZ, Light Trap, Middle Green R., UT*
52507	UDWR-98MO-6232 to 9023	98 Drift Net, Colorado R., Moab, UT

Beginning Cat. No.	Field Numbers	Description of Sample Sets
53373	UDWR-98GR-7143 to 8211	98 Drift Net, Green R., Gray Canyon, UT
53526	UDWR-98MO-7121 & 8221	98 Drift Net, Colorado R., Moab, UT*
53528	(unused)	
53660	UDWR-98YA-7021 to 8203	98 Drift Net, Yampa R., Echo Pk., CO (LFL)
54234	FWS-88Y-0001 to 0038	88 YOY, Fall ISMP, Seine, Colorado R.,CO
54438	(non-UCRB collections)	
54446	(non-UCRB collections)	
54450	(non-UCRB collections)	
54465	FWS-87Y-0011 to 0032	87 YOY, Fall ISMP, Seine, Colo. R.,CO*
54522	FWS/GJ-86Y-CO13 to CO33	86 YOY, Fall ISMP, Seine, Colo. R.,CO
54592	CDOW-77C-811CA to . . .	77 SN&DN; CO, GU, WH, & YA R., CO
54757	CDOW-78C-802CA1 to . . .	78 SN&DN; CO, GU, WH, & YA R., CO
54819	CDOW-79C-829CA to . . .	79 SN&DN; CO, GU, WH, & YA R., CO
54983	CDOW-80C-001 to . . .	80 SN&DN; CO, WH, & YA R., CO
56129	(unused)	
56139	CDOW-79C-479C to . . .	79 SN&DN; Colorado R. & Yampa R., CO*
56300	CDOW-78C-805RF	78 SN&DN; Colorado R., CO*
56301	CDOW-81G-JH01 to . . .	81 SN&DN; CO, GU, WH, & YA R., CO
56358	(above continued after 9/30/99)	

* Additional lots belonging to a previously cataloged sample set.